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E.O. 11652: GDS

TAGS: MNUC, PK, US

SUBJECT: NONNUCLEAR ENERGY ALTERNATIVES FOR PAKISTAN-BACK-
GROUND PAPER

1. FOLLOWING IS TEXT OF DRAFT BACKGROUND PAPER PREPARED BY
OES FOR USE AS EXPLAINED IN PARA A. REQUEST EMBASSY RE-
VIEW AND COMMENTS, AND ANY INFORMATION OF WHICH WE MAY BE
UNAWARE THAT EMBASSY CAN PROVIDE ON EXTENT OR STATUS OF
OTHER EFFORTS TO TAP NON-NUCLEAR RESOURCES DESCRIBED IN
THIS PAPER. WILL APPRECIATE EARLY REPLY ADDRESSED STADIS
AND NEA ONLY.

2. A. OBJECTIVE: A PROGRAM OF NON-NUCLEAR ENERGY COOPERATION
COULD PROVE A HELPFUL ELEMENT OF A BROADER PACKAGE OF IN-
CENTIVES FOR PAKISTAN TO BE RESPONSIVE TO OUR PROLIFERATION
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CONCERNS. TWO GENERAL TYPES OF ACTIVITIES MIGHT INCLUDE:

-- ASSISTANCE IN DEVELOPING PAKISTAN'S INDIGENOUS FOSSIL
FUEL RESOURCES

-- COOPERATION IN THE DEVELOPMENT OF NON-NUCLEAR ENERGY
TECHNOLOGIES PARTICULARLY APPROPRIATE FOR PAKISTANI NEEDS.

3. THE EFFECTIVENESS OF SUCH A PROGRAM IN INFLUENCING THE
COUNTRY'S NUCLEAR POWER DEVELOPMENT PLANS WOULD DEPEND ON
(A) THE DEGREE TO WHICH NON-NUCLEAR RESOURCES ARE SEEN AS

AN ECONOMICALLY COMPETITIVE, RAPID AND EFFECTIVE WAY OF SUPPLYING ENERGY FOR DEVELOPMENT AND (B) THE EXTENT TO WHICH PARTICIPATION IN NON-NUCLEAR TECHNOLOGY VENTURES REPRESENT A POLITICALLY ACCEPTABLE SUBSTITUTE TO NUCLEAR FOR DISPLAYING THE COUNTRY'S TECHNOLOGY CAPABILITIES.

4. B. NON-NUCLEAR ENERGY RESOURCES: PAKISTAN HAS EXTENSIVE NON-NUCLEAR ENERGY RESOURCES WHICH, IF RAPIDLY DEVELOPED, WOULD INFLUENCE THE TIMING AND SCOPE OF THE NEED FOR NUCLEAR POWER.

5. (A)OIL - OIL IMPORTS NEED TO BE REDUCED DRAMATICALLY IF DEVELOPMENT PLANS ARE NOT TO BE SERIOUSLY AFFECTED. CURRENTLY ABOUT DOLS 400 MILLION ARE SPENT ANNUALLY TO IMPORT ABOUT 90 PERCENT OF THE COUNTRY'S NEEDS. 5,500B/D ARE PRODUCED DOMESTICALLY. KNOWN RESERVE ESTIMATES VARY FROM 26 MILLION BARRELS (U.S. GEOLOGICAL SURVEY) TO 60 MILLION BARRELS (U.S. BUREAU OF MINES); THE LATTER FIGURE PROBABLY INCLUDES INDICATED AS WELL AS KNOWN RESERVES. CANADIAN GEOLOGISTS WHO SURVEYED PAKISTAN FOR THE U.N. ESTIMATE THAT PAKISTAN HAS THE GEOLOGIC POTENTIAL FOR FINDING 36 BILLION BARRELS OF RECOVERABLE OIL, OVER 500 YEARS RESERVE AT CURRENT CONSUMPTION LEVELS. PAKISTAN HAS INVITED FOREIGN PARTICIPATION IN ITS OIL HUNT AND 8 FOREIGN COMPANIES ARE CURRENTLY INVOLVED IN EXPLORATION. THE STATE-RUN OIL CONFIDENTIAL

AND GAS DEVELOPMENT CORPORATION HAS GREATLY STEPPED UP ITS OWN EFFORTS AND IS RECEIVING SOVIET TECHNICAL HELP. SO FAR THERE HAS BEEN LITTLE SUCCESS TO SHOW FOR THESE EFFORTS

6. POTENTIAL U.S. ASSISTANCE: IN VIEW OF THE EXISTING ACTIVITIES OF PRIVATE COMPANIES IN OIL EXPLORATION THE USG ROLE MIGHT BE LIMITED TO PROVIDING INFORMATION ON ENHANCED RECOVERY RESEARCH UNDER WAY AT ERDA; THIS COULD PROVIDE ADDITIONAL OIL FROM THE OLD FIELDS WHICH NOW SUPPLY THE BULK OF PRODUCTION. THE U.S. COULD ALSO SUPPORT IFI ASSISTANCE TO ACCELERATED EXPLORATIONS AND DEVELOPMENT PROGRAMS, ESPECIALLY THOSE THAT HAVE INDUSTRY PARTICIPATION

7. (B) COAL - 1975 COAL PRODUCTION IN PAKISTAN TOTALLED 1.3 MILLION METRIC TONS OF WHICH MORE THAN 90 PERCENT WAS USED TO HEAT BRICK KILNS. RESERVES ARE ESTIMATED AT 230-460 MILLION TONS BUT THE COAL IS GENERALLY HIGH MOISTURE, ASH, AND SULFUR WHICH MAKES IT DIFFICULT TO TRANSPORT AND USE ECONOMICALLY FOR POWER PRODUCTION. THIS SITUATION COULD BE ALTERED SIGNIFICANTLY THROUGH GREATER USE OF MINE-MOUTH GENERATING PLANTS AND COAL CONVERSION TECHNOLOGY.

8. POTENTIAL U.S. ASSISTANCE: USG (BUREAU OF MINES, ERDA)

TECHNICAL ASSISTANCE COULD ENCOURAGE IMPROVED MINING, COAL PROCESSING AND COAL CONVERSION TECHNIQUES. GREATER USE OF MINE-MOUTH GENERATION MIGHT REQUIRE ASSISTANCE IN THE APPLICATION OF POWER TRANSMISSION TECHNOLOGY (SEE ALSO HYDROPOWER SECTION); IFI'S COULD BE ENCOURAGED TO FUND MINE DEVELOPMENT AND IMPROVED ELECTRICITY TRANSMISSION NET-WORKS.

9. (C) HYDROPOWER - AT END OF FY 1974 HYDROPOWER PRODUC-TION WAS 867MW. ESTIMATED POTENTIAL FOR PAKISTAN IS 20,000MW; SOME OF THIS POTENTIAL MAY NOT PROVE ECONOMI-CONFIDENTIAL

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CALLY ACHIEVABLE AFTER MORE DETAILED EXAMINATION BECAUSE OF HIGH RATES OF SILTATION. THE TARBELA DAM ON THE INDUS RIVER, SCHEDULED FOR COMPLETION IN 1981-82 WILL ADD AN ADDITIONAL 2300MW. THE KALABAGH DAM WHOSE COMPLETION IS PLANNED FOR 1985 WILL ADD 1125MW. TRANSMISSION LOSSES FROM GENERATING SITES HISTORICALLY EXTREMELY HIGH, ARE CURRENTLY RUNNING ABOUT 30 PERCENT.

10. POTENTIAL U.S. ASSISTANCE: U.S. FINANCIAL ASSISTANCE IS ALREADY FLOWING TO HYDROPOWER PROJECTS UNDER CONSTRUC-TION AND THEIR SCHEDULES ARE NOT LIKELY TO BE SIGNIFICANT-LY ACCELERATED BY MODERATE INCREASES IN THIS SUPPORT. TWO SETS OF ACTIVITIES WOULD APPEAR TO BE MORE HELPFUL. IN 1974, THE PAKISTAN SCIENCE FOUNDATION BEGAN SUPPORTING A SCHEME TO BUILD SMALL HYDROELECTRIC POWER PLANTS WITH SPECIAL TURBINES TO HARNESS ENERGY FROM SMALL FALLS IN THE NORTHERN AREAS. ERDA, AS PART OF ITS EFFORTS TO DEVELOP A PROGRAM OF TECHNOLOGY COOPERATION WITH THE LDCS, IS IN-TERESTED IN SUCH SMALL SYSTEMS AND MIGHT BE INDUCED TO ESTABLISH A COOPERATIVE PROGRAM FOR THEIR DEVELOPMENT AND APPLICATION ON A DEMONSTRATION SCALE. GENERATING AND TRANSMISSION LOSSES REPRESENT A SIZEABLE WASTE OF INDI-GENOUS AND IMPORTED ENERGY RESOURCES. ERDA AND DEPARTMENT OF INTERIOR TECHNICAL EXPERTS COULD HELP CUT SUCH LOSSES THROUGH EXCHANGES OF SPECIALISTS AND TRAINING PROGRAMS. UPGRADING OF THE SYSTEMS THEMSELVES WOULD REQUIRE MORE SUBSTANTIAL FINANCIAL ASSISTANCE BUT COULD PROVE A COST-EFFECTIVE WAY OF IMPROVING THE COUNTRY'S OVERALL ENERGY POSITION.

11. (D) NATURAL GAS - NATURAL GAS IS PAKISTAN'S MOST ABUN-DANT ENERGY RESOURCE. ESTIMATED RESERVES ARE ABOUT 14,332,000 MILLION CUBIC FEET. ANNUAL PRODUCTION (1974) IS CLOSE TO 150,000 MILLION CUBIC FEET, A LITTLE OVER 1

PERCENT OF THE RESERVE FIGURE. THERE ARE LARGE AREAS OF CONFIDENTIAL

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PROMISING UNEXPLORED TERRITORY WHICH HOLD THE POTENTIAL OF RAISING RESERVE LEVEL SEVERAL TIMES OVER THE CURRENT ESTIMATE. THE USE OF GAS AS A POTENTIAL ALTERNATIVE TO NUCLEAR POWER DOES NOT APPEAR TO BE A PROBLEM OF FINDING THE NEEDED SUPPLIES BUT RATHER OF DEVELOPING THEM AND DISTRIBUTING THE RESOURCE TO WHERE IT IS NEEDED. SUPPLIES COULD WELL BE LARGE ENOUGH THAT THEY COULD SUPPORT AN EXPORT INDUSTRY THAT WOULD SERVE BOTH TO HELP THE ENERGY POSITION OF PAKISTAN'S NEIGHBORS AND TO REDUCE THE FINANCIAL BURDEN POSED BY PAKISTAN'S OIL IMPORTS.

12. POTENTIAL U.S. ASSISTANCE: THE POTENTIAL ROLE OF NATURAL GAS IN MOVING PAKISTAN TOWARD ENERGY INDEPENDENCE REQUIRES SUBSTANTIAL SYSTEMS STUDIES USING ADVANCED METHODOLOGIES DEVELOPED BY ERDA FOR DEVELOPING U.S. ENERGY STRATEGIES. THE U.S. IS NOW IN THE PROCESS OF ASSISTING A NUMBER OF COUNTRIES IN MAKING SUCH ASSESSMENTS AND WOULD BE IN A POSITION TO TRAIN PAKISTANI SPECIALISTS IN THIS FIELD. THE U.S. COULD ALSO SUPPLY EXPERTS (PERHAPS UNDER CONTRACT WITH PRIVATE INDUSTRY) TO ASSIST IN MORE DETAILED PLANNING REQUIRED FOR PIPELINE AND DISTRIBUTION SYSTEMS. GAS LIQUEFACTION WOULD PERMIT THE USE OF THIS RESOURCE IN AREAS OF PAKISTAN TO WHICH PIPELINE ACCESS WOULD BE IMPRACTICAL OR UNECONOMIC. IT WOULD ALSO PROVIDE THE BASIS FOR AN EXPORT INDUSTRY. IFI SEED MONEY, SUPPLIED WITH U.S. ENCOURAGEMENT, COULD ACT AS AN INCENTIVE FOR INDUSTRY PARTICIPATION IN LIQUEFACTION VENTURES.

13. BIOCONVERSION: ORGANIC WASTE MATERIALS SUPPLY ALMOST 50 PERCENT OF PAKISTAN'S TOTAL ENERGY REQUIREMENTS. CURRENT UTILIZATION IS MOSTLY IN THE FORM OF DIRECTLY BURNING WOOD, ANIMAL WASTES AND AGRICULTURAL WASTES FOR HOME HEATING, VILLAGE LEVEL AGRICULTURAL INDUSTRIES AND OTHER NONCOMMERCIAL USES. A SMALL NUMBER OF BIOGAS GENERATING UNITS (CONVERTORS THAT GENERATE METHANE FROM ANIMAL AND AGRICULTURAL WASTES) ARE BEING TESTED AT GOVERNMENT DAIR-

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IES AND VILLAGES ACROSS THE COUNTRY.

14. POSSIBLE U.S. ASSISTANCE: BIOCONVERSION TECHNOLOGY FORMS AN IMPORTANT ELEMENT IN ERDA'S PROPOSED PROGRAM OF ENERGY TECHNOLOGY COOPERATION WITH THE DEVELOPING COUNTRIES. U.S. TECHNICAL CAPABILITIES COULD BE USEFULLY APPLIED TO EXPAND THE FORMS OF BIOGAS UTILIZATION AND TO IMPROVE THE EFFICIENCY OF CURRENT APPLICATIONS.

15. SOLAR ENERGY FOR HEATING, COOLING AND SMALL SCALE ELECTRICAL APPLICATIONS: PAKISTAN'S POPULATION DISTRIBUTION

PATTERN AND GEOGRAPHIC LOCATION WOULD MAKE SOLAR ENERGY

CLEARLY USEFUL AS AN INCREMENTAL ENERGY SOURCE, ESPECIALLY IN RURAL AREAS AT SOME DISTANCE FROM POWER DISTRIBUTION NETWORKS. THE PAKISTAN SCIENCE FOUNDATION INITIATED STUDIES ON SOLAR ENERGY IN 1974 AND THERE IS NOW A SOLAR ENERGY GROUP AT THE P.C.S.I.R. LABORATORIES IN LAHORE. TWO SMALL SOLAR PROJECTS ARE UNDER WAY. THE FIRST IS DESIGNED TO EVALUATE SOLAR STOVES FOR COOKING PURPOSES IN SMALL VILLAGES. THE GOAL IS TO HAVE 25,000 SOLAR STOVES MANUFACTURED AND DISTRIBUTED TO VILLAGES BY 1981. THE SECOND PROJECT IS TO EVALUATE THE EXPERIENCE OF OTHER COUNTRIES WHICH ARE USING FRENCH-DEVELOPED SOLAR WATER PUMPS. IF PROVEN SUCCESSFUL ELSEWHERE, PAKISTAN WOULD USE THEM IN REMOTE REGIONS AND IN AREAS WHERE THERE ARE PROB-LEMS OF SALINITY ON IRRIGATED LANDS.

16. POSSIBLE U.S. ASSISTANCE: THIS TOPIC AND BIOCONVERSION SHOULD FORM DESIRABLE INITIAL TOPICS OF ENERGY TECHNOLOGY COOPERATION BETWEEN THE U.S. AND PAKISTAN. AS DESCRIBED EARLIER, ERDA IS NOW IN THE PROCESS OF DEVELOPING A PRO-GRAM OF ENERGY TECHNOLOGY COOPERATION WITH THE LDCS. SMALL SCALE SOLAR PROJECTS WOULD FORM A KEY ELEMENT OF SUCH A PROGRAM AND PAKISTAN WOULD BE AN APPROPRIATE SITE FOR DEMONSTRATION PROJECTS. THESE COULD BE ESTABLISHED IN

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CONJUNCTION WITH AID'S ACTIVITIES IN THE APPLICATION OF APPROPRIATE TECHNOLOGIES TO RURAL DEVELOPMENT AND FOOD PRODUCTION. END OF TEXT.
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Margaret P. Grafeld Declassified/Released US Department of State EO Systematic Review 22 May 2009

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